

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2010.

Ph.D. (ENTOMOLOGY)

COURSE CODE : 135

Register Number :



Signature of the Invigilator
(with date)

COURSE CODE : 135

Time : 2 Hours

Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you -1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. Which insect order is most closely related to Diptera?
 (A) Hymenoptera (B) Plecoptera (C) Thysanura (D) None
2. To which class of arthropods do lobsters and shrimp belong?
 (A) Crustacea (B) Myriapoda (C) Arachnida (D) Xiphosura
3. The order Hemiptera contains:
 (A) Bed bugs and stink bugs (B) Chewing and sucking lice
 (C) Roaches and mantids (D) Crickets and grasshoppers
4. Which order is NOT holometabolous?
 (A) Siphonaptera (B) Thysanoptera
 (C) Hymenoptera (D) Neuroptera
5. Which order is exclusively herbivorous?
 (A) Trichoptera (B) Phasmatodea
 (C) Odonata (D) Thysanoptera
6. Which order is exclusively parasitic?
 (A) Diplura (B) Zoraptera (C) Phthiraptera (D) Diptera
7. Sucking mouthparts are NOT found in
 (A) Fleas (B) Flies (C) Lice (D) Ants
8. All ametabolous insects are
 (A) Predatory (B) Wingless (C) Endognathous (D) All of these
9. Immatures of the Neuroptera would be classified as
 (A) Scavengers (B) Herbivores (C) Parasites (D) Predators
10. What do the orders Mantodea, Dermaptera and Isoptera have in common?
 (A) Winglessness (B) Herbivory
 (C) Chewing mouthparts (D) All of these
11. Ticks and mites belong to
 (A) Insecta (B) Crustacea (C) Diplopoda (D) Arachnida

12. Which social insect produces the biggest colony
(A) Bees (B) Ant (C) Termites (D) Wasps
13. An insect helping in pollination is
(A) *Drosophila* (B) *Musca domestica*
(C) *Bombyx mori* (D) *Apis dorsata*
14. A spider spins the web by means of a secretion of
(A) Abdominal glands (B) Salivary glands
(C) Thoracic glands (D) Mouth
15. Which is a living fossil
(A) *Limulus* (B) *Peripatus* (C) *Lepisma* (D) *Pediculus*
16. Which respire by book lungs
(A) Spider (B) *Scolopendra* (C) *Palaemon* (D) *Anopheles*
17. Which class of animals has the maximum number of species
(A) *Mammalia* (B) *Insecta* (C) *Polychaeta* (D) *Crustacea*
18. Blood colour of arthropoda is
(A) Colourless (B) Reddish (C) Bluish (D) Yellow
19. Apiculture is
(A) Culture of silk worms (B) Culture of honey bees
(C) Culture of ants (D) Culture of termites
20. Filariasis/elephantiasis disease is transmitted by
(A) *Musca domestica* (B) *Phlebotomus argentipes*
(C) *Culex quinquefasciatus* (D) *Aedes aegypti*
21. Reduviid bugs are also known as
(A) Laughing Bugs (B) Hissing Bugs
(C) Kissing Bugs (D) Ticking Bugs

22. *Trypanosoma brucei* is transmitted by
 (A) Tsetse fly (B) Sand fly (C) Bed Bug (D) Mosquitoes
23. *Culex* is the genus under the order
 (A) Hemiptera (B) Siphonoptera
 (C) Anoplura (D) Diptera
24. To develop optimally *Simulium* (Black flies) larvae require
 (A) Cool sandy soil (B) Stagnant water
 (C) An intermediate host (D) Well oxygenated running water
25. *Glossina morsitans* transmits
 (A) *Onchocerca volvulus* (B) *Hymenolepis diminuta*
 (C) *Trypanosoma brucei gambiense* (D) *Trypanosoma brucei rhodesiense*
26. Crayfish and crabs serve as the intermediate hosts for :
 (A) *Paragonimus westermani* (B) *Schistosoma mansoni*
 (C) *Theileria parva* (D) *Brugia malayi*
27. Which is not true for dengue fever?
 (A) It is viral disease
 (B) Reservoir of infection is humans
 (C) Principal vector is *Aedes aegypti*
 (D) Principal vector is *Anopheles culicifacies*
28. The intermediate host of *Dracunculus medinensis* is
 (A) A mosquito (B) A rotifer (C) A black fly (D) A crustacean
29. What would be the best definition for medical Entomology?
 (A) The scientific study of insects
 (B) The study of economic losses of commercially important animals and plants due to insect predation
 (C) Branch of science that deals with insects that cause disease or that serve as vectors of organisms that cause disease in humans
 (D) Application of insect evidence to criminal investigations and civil cases

30. Filariasis is caused by
 (A) Wuchereria (B) Culex (C) Trichinella (D) Schistosoma
31. The organism most commonly causing genital filariasis in most parts of India?
 (A) *Dirofilaria* (B) *Wuchereria bancrofti*
 (C) *Onchocerca volvulus* (D) *Brugia malayi*
32. Soft tick transmits
 (A) Relapsing fever (B) Kyasanur forest disease
 (C) Tick typhus (D) Tularemia
33. Identify the scientist in the photograph (clue : He discovered epidemic typhus is transmitted by lice)
 (A) Stanislaus Joseph Matthias von prowazek
 (B) Charles - Jules - Henri Nicolle
 (C) Howard Taylor Ricketts
 (D) Henrique da Rocha Lima
34. Which of the following diseases is transmitted to human through the tsetse fly
 (A) Lymphatic filariasis (B) Sleeping sickness
 (C) Small pox (D) Anthrax
35. Which amongst the following abbreviations stands for organization related to health research?
 (A) DRDO (B) ICMR (C) DOD (D) DRDE
36. Which amongst the following abbreviations stands for organization related to vector control programme?
 (A) NVBDCP (B) NARI (C) IVRI (D) ICAR
37. Human disease pathogens are transmitted by which order?
 (A) Hymenoptera (B) Thysanoptera
 (C) Diptera (D) All of above

38. Housefly breeding is an index of
- (A) Standard of living
 - (B) Standard of public hygiene
 - (C) Standard of personal hygiene
 - (D) Standard of low socio-economy
39. The object of larval collection
- (A) Density of larvae/vector larvae
 - (B) Mapping breeding places and seasonal variations
 - (C) Assessing the impact of control measures
 - (D) All of the above
40. Identify the scientist in the photograph (clue : In 1902 he was awarded the Nobel prize in Medicine for his remarkable work on malaria)
- (A) Sir Patrick Manson
 - (B) Sir Gordon Covell
 - (C) P C G Garnham
 - (D) Sir Ronald Ross
41. Which of the following parasites does not cause lymphatic filariasis in human
- (A) *Brugia malayi*
 - (B) *Brugia timori*
 - (C) *Brugia pahangi*
 - (D) *Wuchereria bancrofti*
42. Drug of choice for the control of filariasis
- (A) Diethyl carbamazine
 - (B) Paracetamol
 - (C) Brufen
 - (D) Nifedepine
43. Choose the odd one
- (A) Induced sterility
 - (B) Cytoplasmic incompatibility
 - (C) DDT residual spray
 - (D) Chromosomal translocations
44. The object of adult mosquito collection
- (A) Density of mosquitoes in general and vector density
 - (B) Species composition and seasonal variation of species in a year
 - (C) Incrimination of local vector by dissection
 - (D) All of the above

45. Clinical characteristic of Dengue Fever
- (A) Hypotension (B) Hypertension
(C) Rash (D) Hypothermia
46. Danger signs of Dengue Haemorrhagic Fever
- (A) Abdominal pain
(B) Persistent vomiting
(C) Abrupt change from fever to hypothermia
(D) All of the above
47. Pedicel is the name for the
- (A) 1st leg segment (B) 2nd leg segment
(C) 1st antennal segment (D) 2nd antennal segment
48. Which hormone would NOT be found in adult insects?
- (A) Brain hormone (PITH) (B) Ecdysis hormone
(C) Juvenile hormone (D) All of these
49. Aquatic immatures of all holometabolous insects are known as
- (A) Nymphs (B) Naiads (C) Larvae (D) Young
50. Suppose you find an interesting arthropod living on the bottom of a fresh water pond. It has eyes, antennae, mandibles, and 10 pairs of legs. You conclude that this organism belongs in the class
- (A) Insecta (B) Diplopoda (C) Crustacea (D) Arachnida
51. "Lumpers" sometimes include Blattodea and Phasmoda as suborders of
- (A) Hemiptera (B) Phthiraptera (C) Orthoptera (D) Neuroptera
52. Chewing mouthparts are NOT found in :
- (A) Thrips (B) Millipedes (C) Crayfish (D) Bees
53. Which order is exclusively herbivorous?
- (A) Hemiptera (B) Phasmoda (C) Odonata (D) Thysanoptera

54. In insect development, the germ band
- (A) Forms the amnionic membrane
 - (B) Differentiates into three germ layers
 - (C) Gives rise to the cleavage and activation centers
 - (D) None of the above
55. Which part of a molt does NOT occur during apolysis?
- (A) Formation of new epicuticle
 - (B) Resorption of old endocuticle
 - (C) Formation of new quinone crosslinkages
 - (D) Activation of molting fluid
56. In larval insects, which hormone inhibits the development of imaginal discs?
- (A) Juvenile hormone
 - (B) Eclosion hormone
 - (C) Brain hormone
 - (D) Ecdysteroids
57. Which insect order is most closely related to Dermaptera?
- (A) Hymenoptera
 - (B) Plecoptera
 - (C) Orthoptera
 - (D) Thysanoptera
58. The order orthoptera contains
- (A) Bed bugs and stink bugs
 - (B) Chewing and sucking lice
 - (C) Roaches and mantids
 - (D) Crickets and grasshoppers
59. Which arthropods have chelicerae?
- (A) Spiders
 - (B) Shrimp
 - (C) Millipedes
 - (D) All of these
60. Which characteristic would NOT be found in the onychophora
- (A) One pair of antennae
 - (B) Three tagmata
 - (C) Jointed legs with claws
 - (D) Segmented body
61. Which order is exclusively hematophagous (blood feeders)?
- (A) Siphonaptera
 - (B) Phasmida
 - (C) Thysanoptera
 - (D) Hymenoptera

62. Which structure is ALWAYS associated with the Hymenoptera?
 (A) Furcula (B) Collophore (C) Hamuli (D) Elytra
63. Chewing mouthparts NEVER occur in :
 (A) Fleas (B) Beetles (C) Earwigs (D) Bees
64. All neopterous insects are
 (A) Predatory (B) Ectognathous
 (C) Wingless (D) Hemimetabolous
65. Which developmental stage is found only in the Ephemeroptera?
 (A) Prepupa (B) Naiad (C) Subimago (D) Imago
66. Which orders are most important in the transmission of human disease?
 (A) Phasmatodea and odonata (B) Diptera and phthiraptera
 (C) Hymenoptera and Siphonaptera (D) Hemiptera and Thysanoptera
67. Match each insect in the left column with its correct order name in the right column
- | | |
|-------------------|------------------|
| (a) Springtails | (1) Archeognatha |
| (b) Leafhoppers | (2) Psocoptera |
| (c) Bristle tails | (3) Hemiptera |
| (d) Booklice | (4) Collembola |
- | | | | |
|-------|-----|-----|-----|
| (a) | (b) | (c) | (d) |
| (A) 4 | 3 | 1 | 2 |
| (B) 1 | 2 | 3 | 4 |
| (C) 3 | 4 | 1 | 2 |
| (D) 2 | 1 | 4 | 3 |
68. The damage caused by larvae of calliphorids is termed as
 (A) Blow (B) Kallos (C) Lightning (D) Strike
69. Answer TRUE or FALSE
 (A) Centipedes and millipedes belong to the SAME subphylum as spiders and ticks
 (B) Honey bees are more closely related to ants than to butterflies and moths
 (C) Aquatic immatures of ALL holometabolous insects are known as larvae
 (D) All insects in the orders Diptera and phthiraptera have sucking mouthparts

70. Match the following

- | | |
|-------------------|----------------|
| (a) Silverfish | (1) Plecoptera |
| (b) Stoneflies | (2) Orthoptera |
| (c) Scorpionflies | (3) Mecoptera |
| (d) Katydid | (4) Thysanura |

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | 2 | 3 | 4 | 2 |
| (B) | 1 | 4 | 3 | 2 |
| (C) | 4 | 1 | 3 | 2 |
| (D) | 3 | 2 | 1 | 4 |

71. Match each characteristic in the left column with its correct order in the right column

- | | |
|--------------|-------------------|
| (a) Elytra | (1) Collembola |
| (b) Subimaga | (2) Blattodea |
| (c) Furcula | (3) Coleoptera |
| (d) Ootheca | (4) Ephemeroptera |

- | | (a) | (b) | (c) | (d) |
|-----|-----|-----|-----|-----|
| (A) | 4 | 3 | 1 | 2 |
| (B) | 1 | 3 | 4 | 2 |
| (C) | 2 | 4 | 3 | 1 |
| (D) | 4 | 1 | 2 | 3 |

72. Which of the following terms includes all of the others

- | | |
|-----------------------|-------------------------|
| (A) Genetic diversity | (B) Species diversity |
| (C) Bio diversity | (D) Ecosystem diversity |

73. An insect that has evolved to resemble a plant twig will probably be able to avoid

- | | |
|------------------|----------------|
| (A) Competition | (B) Parasitism |
| (C) Commensalism | (D) Predation |

74. The most dangerous medical condition associated with ticks

- | | |
|-----------------------|-----------------------|
| (A) Tick borne typhus | (B) Allergic reaction |
| (C) Tick paralysis | (D) Lyme disease |

75. Mayflies laying eggs on roads instead of in water involves which of the following?

- (A) Insecticide poisoning
- (B) A defective behavioural gene
- (C) Trial-and-error learning
- (D) Misdirected response to sign stimulus

76. In Onchocerciasis, damage to human eyes results from host responses to :
- (A) L1 larvae (B) L2 larvae
(C) L3 larvae (D) L4 larvae and adults
77. Which Indian doctor discovered a cure for Kala-Azar (Visceral Leishmaniasis)
- (A) Dr. C. P. Thakur (B) Dr. U. M. Brahmachari
(C) Dr Homi Bhaba (D) Dr Vikram Sarabhai
78. Who invented the first man-made insecticide, D.D.T?
- (A) Paul Muller (B) Rachel Carson
(C) Othmar Zeidler (D) David Peakall
79. Which of the following is a long term complication in Filariasis
- (A) High blood pressure
(B) Swelling of the leg(s) [lymphoedema]/hydrocele
(C) Frequent acute attacks of infection of the affected leg(s)
(D) Diabetes
80. Removal of ticks from the skin is best achieved by
- (A) Gently heating the tick (B) Extracting with sharp forceps
(C) Extracting with blunt forceps (D) Manually pulling the tick out
81. Fleas
- (A) Commonly spread typhus
(B) Are more a cause of irritation than actual disease
(C) Can bite at all stages of development after hatching from eggs
(D) Can fly short distances
82. *Aedes albopictus*
- (A) Can only mate with its kind
(B) Bites during the night time
(C) Eggs are destroyed by cold winters
(D) Is an aggressive day biter even in sun

83. Which of the following are important biotic factors that can affect the structure and organization of biological communities?
- (A) Nutrient availability, soil pH, light intensity
 - (B) Precipitation, wind, temperature
 - (C) Predation, competition, disease
 - (D) All of the above
84. Which of the following levels of organization is arranged in the correct sequence from most to least inclusive
- (A) Ecosystem, community, population, individual
 - (B) Community, ecosystem, individual, population
 - (C) Population, ecosystem, individual, community
 - (D) Individual, community, population, ecosystem
85. Trypanosomiasis, or "sleeping sickness" is caused by a member of the
- (A) Dinoflagellates
 - (B) Zoomastigotes
 - (C) Sporozoans
 - (D) Radiolarians
86. During a field trip, the instructor touched the body of a moth that was sitting on a tree trunk ; the moth raised its forewings to reveal large eye-spots on its hind wings. The instructor asked the class why the moth lifted its wings. One student said that certain sensory receptors had fired and triggered a neuronal reflex culminating in the contraction of certain muscles. A second student responded that behaviour might frighten would-be predators. What can you say about the explanations of these two students?
- (A) The first response is correct, while the second is incorrect
 - (B) Both explanations are reasonable and simply represent a difference of opinion
 - (C) The first response answers a proximate question, while the second answers an ultimate question
 - (D) The first response is biological, while the second is philosophical
87. Malaria results from a mosquito injecting the _____ of plasmodium into the human blood stream
- (A) Sporocyst
 - (B) Merozoites
 - (C) Gametocytes
 - (D) Sporozoites
88. Larvae on aquatic plants in Asia
- (A) Anophelines
 - (B) Culicines
 - (C) Mansonoides
 - (D) Aedines

89. Discarded tyres, artificial containers, pots, discarded containers
(A) *Culex quinquefasciatus* (B) *Aedes aegypti*
(C) *Armigeres subalbatus* (D) *Anopheles culicifacies*
90. *Aedes aegypti*
(A) Night biter
(B) Prefers to bite people on the ankles and calves
(C) Is a native South American mosquito
(D) Flies many kilometers from breeding places
91. After the tick attaches to humans
(A) Only female ones can pass on the disease
(B) 12 hours may pass before the tick starts to feed
(C) The tick has maximum feeding period of 1 minute
(D) Blood meal is essential for passing on viral/bacterial infections
92. Data to be collected in a filariasis survey
(A) Microfilaraemia prevalence rate and microfilaria load in the community
(B) Filarial disease rate
(C) Filarial endemicity rate
(D) All of the above
93. A cage with male mosquitoes in it has a small earphone placed on top, through which the sound of a female mosquito is played. All the males immediately fly to the earphone and thrust their abdomens through the fabric of the cage. Which of the following best describes this?
(A) Copulation is a fixed action pattern, and the female flight sound is a sign stimulus that initiates it
(B) Through classical conditioning, the male mosquitoes have associated the inappropriate stimulus from the earphone with the normal response of copulation
(C) The reproductive drive is so strong that when males are deprived of females, they will attempt to mate with anything that has even the slightest female characteristic
(D) The males learn to associate the sound with a female and are thus attracted to it

94. Partially blocked drains, polluted waters, high organic content supports breeding of
 (A) *Culex quinquefasciatus* (B) *Anopheles stephensi*
 (C) *Aedes aegypti* (D) *Aedes albopictus*
95. Malaria is a disease with affects the
 (A) Heart (B) Lungs (C) Spleen (D) Kidney
96. The stage of *Wuchereria bancrofti* that is ingested by the mosquito
 (A) L1 (B) L2 (C) L3 (D) mf
97. Producing a vaccine against the tsetse fly-borne trypanosomes is very difficult because
 (A) Tsetse flies are hard to grow in captivity
 (B) Trypanosomes each have over a thousand genes for antigens but express only one at a time
 (C) The disease is only expressed in humans and experimental subjects are hard to get
 (D) The trypanosome does not cause an antibody response
98. What is the recommended strategy for lymphatic filariasis elimination?
 (A) 12 day course of DEC of patients who come for treatment
 (B) Night blood survey and 12 day treatment of those found positive
 (C) Mass drug administration of eligible population of endemic areas once a year
 (D) Mass drug administration of the eligible population of endemic areas once year for 5 years
99. Answer TRUE or FALSE
 (A) Spiders, ticks and horseshoe crabs belong to the subphylum Mandibulata
 (B) Dragonflies are more closely related to scorpionflies than to stoneflies
 (C) The immature stages of some holometabolous insects are called naiads
 (D) Both Arthropods and Onychophorans have open circulatory systems
100. Introduced species
 (A) Can disrupt the balance of the natural species with which they become associated
 (B) Often fail to colonize the new area
 (C) May become common enough to become pests
 (D) All of the above